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TECHNICAL SPECIFICATION

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Universal Mobile Telecommunications System (UMTS);  
LTE;  
Multimedia Broadcast/Multicast Service (MBMS) user services;  
Stage 1  
(3GPP TS 22.246 version 15.0.0 Release 15)**



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## Foreword

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## Introduction

TS 22.146 [2] specifies the multimedia broadcast and multicast service (MBMS) application independent transport service and includes some guidance on application services and bit rates. The present specification defines MBMS User Services that use the capabilities of MBMS. Service related information is defined in this specification to specify requirements in terms of data rates, quality of service requirements, typical volumes of data etc.

MBMS User Services may be delivered to a user at different bit rates and quality of service depending on radio networks and conditions. This technical specification describes service scenarios for MBMS User Services.

In addition scenarios related to security and charging are described providing information for detailed MBMS User Services security and charging mechanisms to be specified. The service scenarios described in this specification are not exhaustive, it is possible that MBMS may be used for services that are not included in this specification. The present specification describes the minimal requirements for interoperability for MBMS based services. This specification establishes a basis which can also be used for future services.

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# 1 Scope

The present document describes MBMS User Services that use the capabilities of MBMS. Application scenarios including charging, QoS aspects and related service requirements derived from them are described. These scenarios and service requirements can be used as guidance for the design of codecs and bearers.

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## 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] 3GPP TR 21.905: "Vocabulary for 3GPP specifications".
  - [2] 3GPP TS 22.146: "Multimedia Broadcast/Multicast Service".
  - [3] 3GPP TS 26.140: "Multimedia Messaging Service (MMS): Media formats and Codecs".
  - [4] 3GPP TS 26.134: "Transparent end-to-end Packet-switched Streaming Service (PSS) Protocols and codecs".
  - [5] 3GPP TS 22.240 "Service requirement for the 3GPP Generic User Profile (GUP)".
  - [6] 3GPP TS 22.242: "Digital Rights Management".
  - [7] 3GPP TS 24.002: "GSM-UMTS Public Land Mobile Network (PLMN) Access Reference Configuration".
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## 3 Definitions and abbreviations

### 3.1 Definitions

For the purposes of the present document, the definitions in 3GPP TR 21.905 [1] as well as the following definitions apply.

**Broadcast service area:** see TS 22.146: "Multimedia Broadcast/Multicast Service" [2].

**Local Broadcast Area:** see TS 22.146: "Multimedia Broadcast/Multicast Service" [2].

**Broadcast mode:** see TS 22.146: "Multimedia Broadcast/Multicast Service" [2].

**Broadcast service:** see TS 22.146: "Multimedia Broadcast/Multicast Service" [2].

**Broadcast session:** see TS 22.146: "Multimedia Broadcast/Multicast Service" [2].

**MBMS transport service:** A MBMS transport service is either a broadcast service or a multicast service as defined in TS 22.146 [2].

**MBMS User Services:** Services that are intended to be delivered to multiple users simultaneously. MBMS User Services use the capabilities of the MBMS application independent transport.

**Media types:** a media type refers to one form of presenting information to a user, e.g. voice or fax.

**Mobile Station (MS):** see TS 22.146: "Multimedia Broadcast/Multicast Service" [2].

**Multicast transmission activation:** see TS 22.146: "Multimedia Broadcast/Multicast Service" [2].

**Multicast service area:** see TS 22.146: "Multimedia Broadcast/Multicast Service" [2].

**Local multicast area:** see TS 22.146: "Multimedia Broadcast/Multicast Service" [2].

**Multicast mode:** see TS 22.146: "Multimedia Broadcast/Multicast Service" [2].

**Multicast joining:** see TS 22.146: "Multimedia Broadcast/Multicast Service" [2].

**Multicast session:** see TS 22.146: "Multimedia Broadcast/Multicast Service" [2].

**Multimedia Broadcast/Multicast Service (MBMS):** see TS 22.146: "Multimedia Broadcast/Multicast Service" [2].

**Multicast group:** see TS 22.146: "Multimedia Broadcast/Multicast Service" [2].

**Multicast service:** see TS 22.146: "Multimedia Broadcast/Multicast Service" [2].

**Multicast subscription:** see TS 22.146: "Multimedia Broadcast/Multicast Service" [2].

**Multicast Subscription Group:** see TS 22.146: "Multimedia Broadcast/Multicast Service" [2].

**User Equipment:** defined in TS 21.905. An occurrence of a User Equipment is an MS for GSM as defined in TS 24.002 [7].

## 3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

MBMS	Multimedia Broadcast/Multicast Service
MS	Mobile Station
PSS	Packet-switched Streaming Service
UE	User Equipment

## 4 Classification of MBMS User Services

There exist many services and applications that can be provided over the application independent MBMS transport [2]. It is not necessary to standardise specific end user services because the deployment of particular applications and services over the capabilities provided by the 3GPP system is operator specific and outside the scope of standardisation. However, it is possible to classify MBMS User Services according to the method used to distribute these services.

There are four types of MBMS User Service considered within this specification.

- Streaming services

A continuous data flow providing a stream of continuous media (i.e. audio and video) is a basic MBMS User Service. Like digital video broadcasting, supplementary information of text and/or still images (static media) is also important. For example, if text includes URLs of some content on the Internet, a user can easily access the content without entering the URL for herself. Still images may also be used for banner images that advertise some product or service. These static media need to be synchronized and displayed with audio/video streams.

Note: Streaming in the context of MBMS User Services may not be the same as that described e.g. within PSS [4].

- File download services

This service delivers binary data (file data) over an MBMS bearer. An MBMS client (i.e. UE) activates an appropriate application, and utilises the delivered data. The most important functionality for this service is reliability. In other words, it is necessary that the user receive all the data sent in order to experience the service.

- Carousel services

Carousel is a service that combines aspects of both the Streaming and File download services described above. Similar to the streaming service this service includes time synchronisation. However, the target media of this

service is only static media (e.g. text and/or still images). Time synchronization with other media is also required. For example, text objects are delivered and updated from time to time. Still images may also be collated to display low frame-rate video. In common with the download service this service also includes reliability (typically 100% reliability is not always necessary). The benefit of this service is that it is possible over a low bit-rate bearer.

An example of an application utilising the Carousel service is a 'ticker-tape' type service in which the data is provided to the user repetitively and updated at certain times to reflect changing circumstances.

- Television (TV) service

The Television service is an MBMS service consisting of synchronised streaming audio and visual components.

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## 5 High level requirements

### 5.0 General

MBMS user services are services an operator may provide to subscribers. MBMS user services use the capabilities of MBMS. The operator may provide such services on his own or in collaboration with third party service providers. In addition, an MBMS user service may be provided to the operator's own subscribers and/or to inbound roaming subscribers from other operators.

#### MBMS User Services

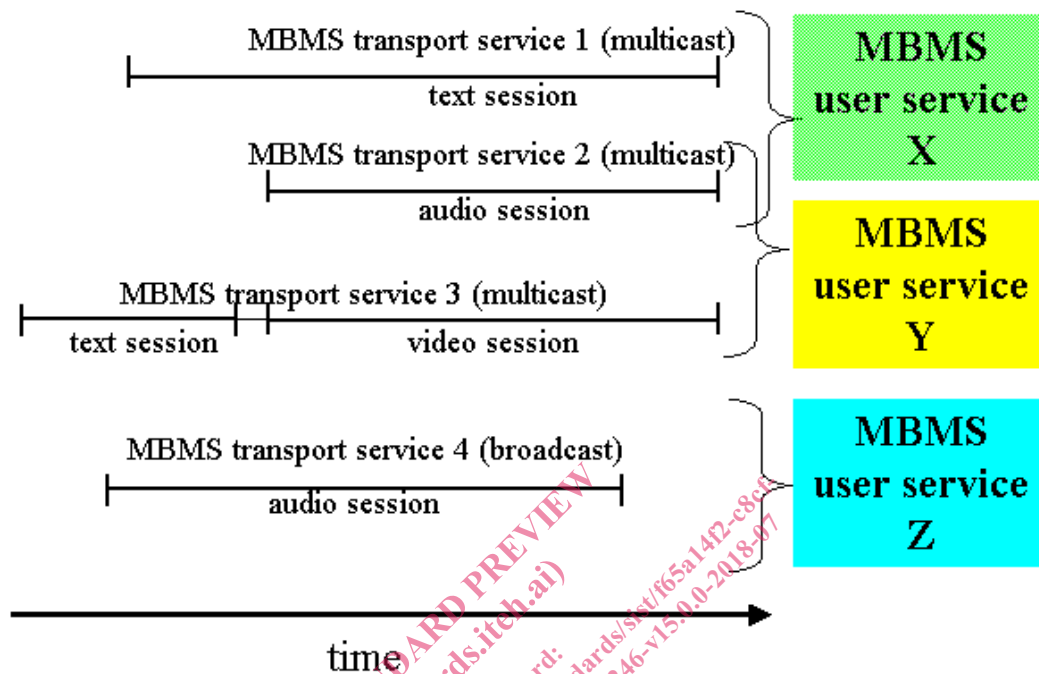
MBMS user services are based on broadcast- or multicast services, which are defined in TS 22.146 [2].

MBMS user services shall be bearer agnostic to enable access via generic IP access systems.

An MBMS user service may use one or more broadcast- or multicast services at a time within the MBMS service area bound to this user service.

- Note 1: A single broadcast- or multicast service can only have one broadcast- or multicast session at any time within the MBMS service area bound to this user service. A broadcast- or multicast service may consist of multiple successive broadcast- or multicast sessions. (see TS 22.146 [2])
- Note 2: As part of the same multicast service, it should be possible for the operator to provide the UEs with multiple successive sessions with different quality-of-service for each session. (see TS 22.146 [2])





It shall be possible for an MBMS user service to make use of different application independent MBMS transport services at different times or in parallel. The MBMS transport services used may vary for instance in QoS parameters or target broadcast or multicast area.

It shall be possible for one application independent MBMS transport service to be used by more than one MBMS user service at a time.

If an MBMS user service makes use of several application independent MBMS transport services then these may only consist of either broadcast or multicast services, but not of a combination of both.

Note: The combination of broadcast- or multicast services in future releases is FFS

When necessary, within a single MBMS user service, it shall be possible to synchronize the media sessions.

NOTE: For different application independent MBMS transport services to support a single MBMS user service it may be necessary to logically link the transport services to each other, as illustrated in the figure for the audio- and video session of MBMS user service X.

The UTRAN, GERAN and E-UTRAN accesses shall provide protection against normal transmission errors (eg interference not related to cell changes and handovers).

Non 3GPP access system used to transport MBMS user services should provide protection against normal transmission errors (e.g. interference not related to cell changes and handovers).

The BM-SC is responsible for providing protection e.g. FEC, long interleaving and/or point to point repairing the transmission, against errors (eg those caused by cell changes and longer breaks in transmission).

### Service examples

MBMS user services may be classified according to the table within Annex A of this specification into several service examples, which are characterized by

- Their predominant broadcast- or multicast service, that constitutes this MBMS user service together with its reliability (QoS) and data transfer rate requirements
- Media types that are transmitted via this broadcast- or multicast service
- Type of the service, which implies handling of the distributed media by the UE (e.g. download for subsequent presentation, streaming for instant presentation or carousel downloading)
- Charging characteristics
- A potential requirement for point-to-point delivery verification for delivered content.

To express the requirements for standardised service types are one objective of the present specification.

### Service classes

MBMS user services may be provided for many purposes to the user and may convey information of various kinds. E.g. some services may be used for traffic information, others for entertainment or for news services. Service classes denote a classification of MBMS user services according to their usage. However, service class values are not in the scope of 3GPP standardisation but may be subject of inter-operator service arrangements.

## 5.1 Common requirements to broadcast and multicast

The following list describes requirements on an application level:

### **Service classes**

In case of roaming a user shall be able to enjoy services as follows:

- A user shall be able to activate services that are provided locally in the visited network, as allowed by the user's home environment (e.g. local tourist information).
- A user subscribed to a service class in the HPLMN shall be able to enjoy equivalent services in the same service class as provided by a visited PLMN without explicit subscription in the VPLMN (e.g. weather forecast).

A user subscribed to a service class in the HPLMN shall be able to have access to home contents provided via a visited PLMN without explicit subscription in the VPLMN (e.g. enjoy subscribed service while roaming)

### **Service Interworking**

The user shall be able to manipulate content delivered over MBMS and forward it using other services (e.g. MMS, Speech Call- and IMS signalling, Hyperlinks, ....). Care should be taken in order to fulfil requirements concerning DRM and respective barring and charging capabilities.

When interacting with user profiles, MBMS User Services shall use the mechanisms described in [5] TS 22.240 (Generic User Profile).

### **Content storage in the UE**

It shall be possible for the UE to store content delivered to it over MBMS and provide it to the user at a later time. Care should be taken in order to fulfil requirements concerning DRM and respective charging capabilities.

### **Data formats and types**

Media types shall be supported independent of specific data types and formats behind..

As a minimum MBMS User Services shall support the following media types:

- Text

It shall be possible to embed hyperlinks and to decorate text within content provided by MBMS User Services.

- Still Images